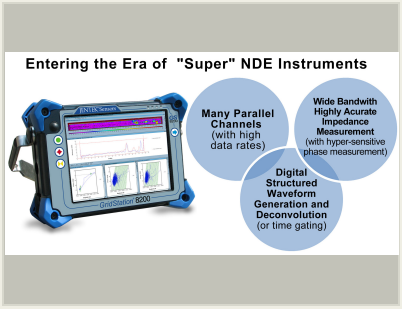
Entering the Era of "Super" NDE Instruments, Followed by Progressive Miniaturization, Phase I

Completed Technology Project (2014 - 2014)

Project Introduction

An ideal NDE data acquisition and analysis tool would be a versatile and precise device capable of providing support for a large number of inspections using numerous inspection methods such as JENTEK's Meandering Winding Magnetometer (MWM) inspection, Standard Eddy Current Testing (ET), Ultrasonic Testing (UT), and other digitized NDT methodologies. Such a "super" instrument could address NASA's need for improved nondestructive evaluation (NDE) of complex built up structural components for space flight hardware, as well as provide new capability for other challenging material constructs. A leap in capability will be demonstrated that is suitable for applications including multi-layered coatings, composites, thin metal layers, thermal protection systems, tiles, felts, micrometeoroid shielding, composite overwrapped pressure vessels, and difficult to inspect locations. For this proposal a "super" instrument is defined as an instrument that has (1) many parallel channels with high data rate capabilities, that (2) each perform at the highest signal to noise and bandwidth performance made possible by the latest generation digital and analog electronics components, and (3) digital structured waveform generation and deconvolution capability. This proposed Phase I SBIR will demonstrate the capability of JENTEK's new 8200 instrument for two selected NASA needs; one for rapid imaging of complex built up structures, and a second for an inspection that cannot be addressed by conventional NDE methods. This Phase I will also lay the foundation for modifications in Phase II that address specific identified technology gaps needed to provide a leap in NDE capabilities, and will demonstrate an integrated prototype to TRL 5 that specifically addresses the need for "astronaut crews to make important assessments quickly" while also reducing their inspection related burdens. The final system will not only support JENTEK MWM arrays, but also other NDE methods such as UT.



Entering the Era of "Super" NDE Instruments, Followed by Progressive Miniaturization Project Image

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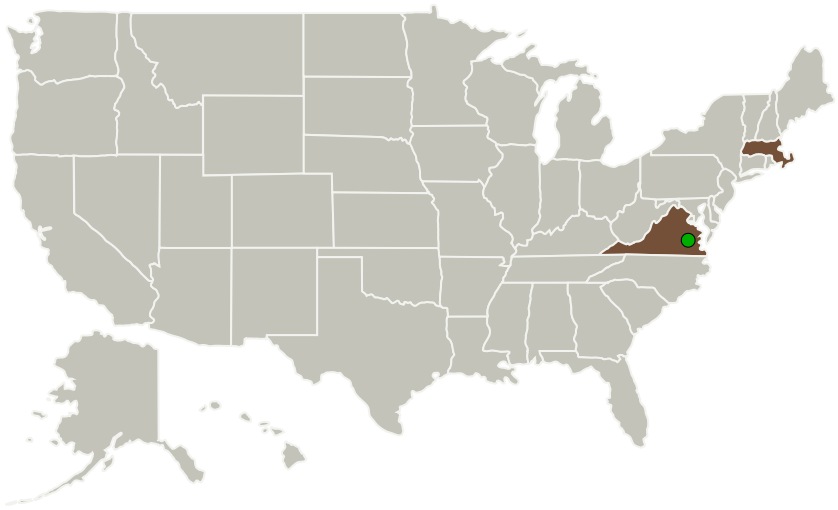
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
JENTEK Sensors, Inc.	Lead Organization	Industry	Waltham, Massachusetts
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Massachusetts	Virginia

Project Transitions

June 2014: Project Start

December 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137574)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

JENTEK Sensors, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

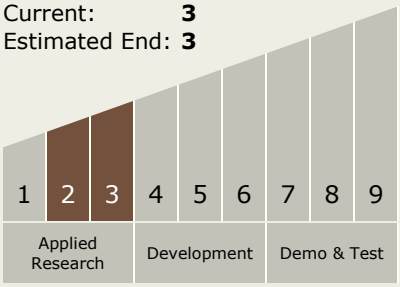
Carlos Torrez

Principal Investigator:

Andrew Washabaugh

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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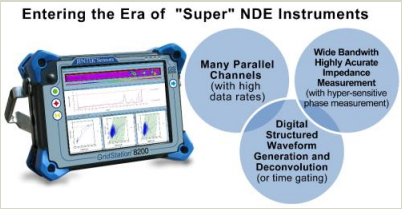
Images



Project Image
Entering the Era of "Super" NDE Instruments, Followed by Progressive Miniaturization Project Image
(https://techport.nasa.gov/image/136557)

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.4 Manufacturing
    - TX12.4.5 Nondestructive Evaluation and Sensors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System